# Proposed Specific Regulatory Level Chemical Causing Cancer: Glyphosate

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Re: Prop 65 NSRL glyphosate levels: Association between cancer and environmental exposure to glyphosate.

In March 2015, the World Health Organization's International Agency for Research on Cancer (IARC) concluded that glyphosate is a class IIa carcinogen; there is ample data of carcinogenicity of glyphosate in animals, however limited evidence exists in humans. The IARC came under intense scrutiny regarding its findings. The European Food Safety Authority (EFSA) and the European chemical Agency (EChA) refuted the IARC findings.

However, Dr. Chris Portier, retired Director of the US National Center for Environmental Health, found that the above named agencies missed eight instances where increases in tumors occurred in animals exposed to glyphosate that were statistically significant. He was able to access this data only after members of the European Parliament requested that the data be made available for public review.

Scientists Avila-Vazquez, et al, reported in the February 2017 publication in the International Journal of Clinical Medicine titled, *Association Between Cancer and Environmental Exposure to Glyphosate,* that cancer incidence, prevalence and mortality were two to three times higher than reference values in the small agricultural town of Monte Maiz, Argentina than for the rest of the country. The study was an exploratory ecological study on cancer so causation could not be determined from its findings. Variables of age, sex, occupation, residence, smoking, education level and the presence of other environmental contaminants (such as power lines) were independent variables. Water, soil and grain husks were analyzed.

Chemical contaminants tests showed that glyphosate and AMPA (breakdown product) were detected in 100% of samples in soil and husks. Grain husks had mixed pesticide residues of glyphosate, chlorpyrifos and epoxiconazole. There were various sampling sites tested. Of note, a children's playground contained 68 times more glyphosate that a site belonging to a farm field of corn resistant to glyphosate. Glyphosate far exceeded the other pesticides.

The most common locations of cancer in the patients were found in the breast, colon, prostate, thyroid and skin. 22% of the cancer patients of Monte Maiz were younger than 44 years of age. The crude cancer rate of the town participants is 208% higher that the

nearest large city of Cordoba when adjusted for variables. Two findings were confirmed by local physicians of this study: absolute increase of cancer and a greater rate of younger cancer patients. These findings were comparable in other agricultural towns as well.

Since 1996, when GM soy was brought into Argentina, the use of glyphosate has now increased to 240,000 tonnes per year, one tonne equalling 1,000 kg. (In 2014, the US used approximately 276 million pounds of glyphosate.)

Of concern is that most glyphosate-based herbicide (GBH) usage has occurred in the past 10 years while most studies considered by regulatory agencies were conducted prior to this increase. Since the late 1980s, very few studies have been submitted to the EPA which are germane to the identification and analysis of human health risks. For example, the incidence of non-Hodgkin's Lymphoma (NHL) has nearly doubled in the US between 1975 and 2006. A causal link between GBH exposure and NHL may exist, but has not been evaluated in human populations.

What is particularly problematic is the concern of carcinogenicity of GBHs in children. Because of the slow growing nature of tumors, the ability to study this issue in the pediatric population is limited. Cancer rates in children have risen slightly in the past few years. However, it is still the second leading cause of death in children ages 1-14. What is significant is that there is a 50% increase in cancer compared to 40 years ago. In addition, there is now data that has shown a significant rise in autoimmune disorders in children as well as other diseases of immune function, precursors to the ultimate immunological dysfunction; cancer. Death from autoimmune disease is one of the top 10 leading causes of death in female children and women to age 64.

The concept 'dose makes the poison' is outdated. Data presented in January 2017; *Multiomics reveal non-alcoholic fatty liver disease in rats following chronic exposure to an ultra-low dose of Roundup herbicide,* published in Scientific Reports by Dr. Michael Antoniou and colleagues from Kings College in London, have shown that via cutting-edge technology of assessing metabolomic and proteonomic processes, toxicity to the liver (nonalcoholic fatty liver disease; NAFLD) occurred at ultra low doses of GBHs at . 1ppb. The understanding that cellular destruction occurs at these extremely low levels is an important piece of data in the consideration and determination of safety levels. Whether this phenomenon is occurring in humans must be addressed due to this newest data as well as to the fact that 1 in 4 American now has NAFLD according to the American Liver Association. NAFLD is the precursor to nonalcoholic steatohepatitis (NASH) which can progress to cirrhosis of the liver.

In sum, GBHs cause hepatic toxicity in laboratory animals at ultra-low levels and is correlated with cancer in real-life agricultural communities.